Creative Sensor Technology

Frequently Asked Questions

*Combiflow
Model CBF-100-00*

The following questions have been asked about the Combiflow product. Before calling for technical support, please review to see if your question may be answered here.

1. **Describe the Combiflow's function.**

   Many irrigation controllers are equipped to monitor flow rate using the data for control and water management functions. Most controllers with this feature are equipped with a single flow input. Field conditions may dictate that two flow sensors are required to monitor all of the water being supplied to the system. Examples might include: two separate water supplies such as an onsite supply with municipal back-up, two points of connection for the irrigation system or two different sized flow sensors to accommodate a wide range of irrigation zone flows.

   The Combiflow is a programmable device that allows the signals from two flow sensors to be received and combined into one single output signal. The flow sensors may be two different sizes or even two different manufacturers because each of the flow inputs and the output may be individually programmed using a computer with CST software. Check with the irrigation manufacturer of the control product to be used to determine if using a Combiflow will meet your flow monitoring objectives.

   A Combiflow has nothing to do with combining master valves.

2. **Can I use a Combiflow with other sensors?**

   Yes, in addition to using the Combiflow with Creative Sensor Technology sensors, it may be used with any two-wire impeller type flow sensor manufactured by Data Industrial/Badger Meter. Badger flow sensors are marketed under several brand names by controller manufacturers. It is not compatible with Hunter HFS sensors. Please call technical support to verify other devices**.** Remember also that the sensors can be different sizes, materials or supplied by two different manufacturers.
   For example a CST tee type PVC sensor can be used with a brass Data Industrial/Badger insert sensor.

Rev 1111
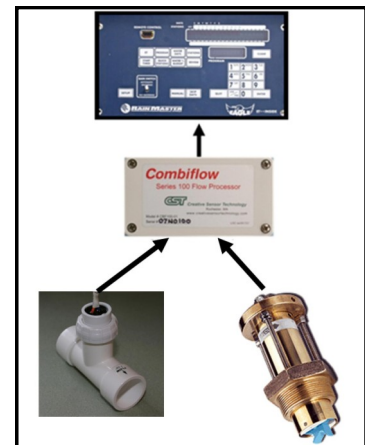
3. **Does it need power?**

   Yes, the Combiflow is a powered device. Connect 12-24 volt AC or DC power to the terminal strip. Some controllers have power output connections. Always check with the controller manufacturer for their recommendations. You may also use an accessory plug-in type AC power supply adapter rated for 120 volts to 12-24 volts AC or DC purchased thru a local electronics store. As good practice, install an inline 250 volt, 125 mA slow blow fuse in series with the power lead.

4. **What do I need to program a Combiflow?**

   1. A computer or laptop running Windows based programs
   2. The Combiflow programming software that may be downloaded free from our web site
       http://www.creativesensortechnology.com/index_files/Page1461.htm
   3. A USB type B cable. This cable, commonly called a printer cable has a square end with two rounded corners. They are easily purchased from any office supply or electronics store.

   Finally, you will need to know the calibration constants, the "K" and "Offset" numbers for each flow sensor you are using to program into the unit.

5. **Where do I find the calibration constants?**

   If you are using CST flow sensors, the calibration constants are located on page 3 of the Installation guide shipped with each sensor. They are also available on the website under Products/Flow Sensors/Cal Constants.   If you are using another brand of sensors, use the calibration constants supplied by the manufacturer.   Remember, "K" and "Offset" numbers are unique to each flow sensor size, model and manufacturer. CST Technical Service may also provide you with this information.

6. **Can I preprogram a Combiflow or must it be installed in the system?**

    You can do either.   The Combiflow may be preprogrammed before taking it to the field. Just remember to connect a power supply to the appropriate terminals. Or, you can wait until the Combiflow is installed in the field and connected to the flow sensors and controller wiring. Again power must be supplied during programming.   The software will guide you through the set up process.

7. **How do I choose what sensor size to use for the output of the Combiflow?**

   That is up to you. All three items, the two flow sensor inputs and the simulated flow sensor output may be independently programmed. If you are using two flow sensors of the same size, you might want to match the output calibration constants to the same ones you're using for the inputs. However, you're not required to do so. The output, the simulated sensor that connects

to the irrigation controller, can be the same as the inputs or different. In cases where you have two different sensor sizes you may choose to make the output the same as the larger or the smaller one. But you also have the option to make it another size. The important thing to remember is that you must make the flow sensor set up in the irrigation controller match the simulated sensor output of the Combiflow. Otherwise, your flow readings will be incorrect.

8. Can I use a Combiflow with the Isoflow product?

Yes, the Combiflow device may be connected in series with Isoflow. With this combination of products you can accept the signals from two flow sensors combine that total flow rate into one output and use that as the input to an Isoflow to provide an isolated flow signal to two individual irrigation controllers. With this combination of products, either controller can receive all the flow information from both flow sensors.

9. Where should I mount the Combiflow?

The Combiflow is housed in a NEMA 6P watertight enclosure. As long as watertight cable glands are used, it can be mounted in exposed locations. However we recommend that it be mounted in a dry location, such as inside a controller pedestal or wall mount enclosure. This is also a convenient place to supply power to the Combiflow using either auxiliary power terminals of the irrigation controller or a separate power supply. Using a Combiflow does not alter or extend the distance limits of the flow sensor field wiring. Using the recommended cable, the total distance from a flow sensor to the controller for CST sensors is 2,000 feet. Finally, in most applications, the Combiflow is connected directly to the field wiring of the two flow sensors. If any analog converters or other signal conditioning devices are required, make sure that they are connected to the output of the Combiflow. Contact technical support if you have unique connection requirements.

10. What kind of wire do I use to connect flow sensors to a Combiflow?
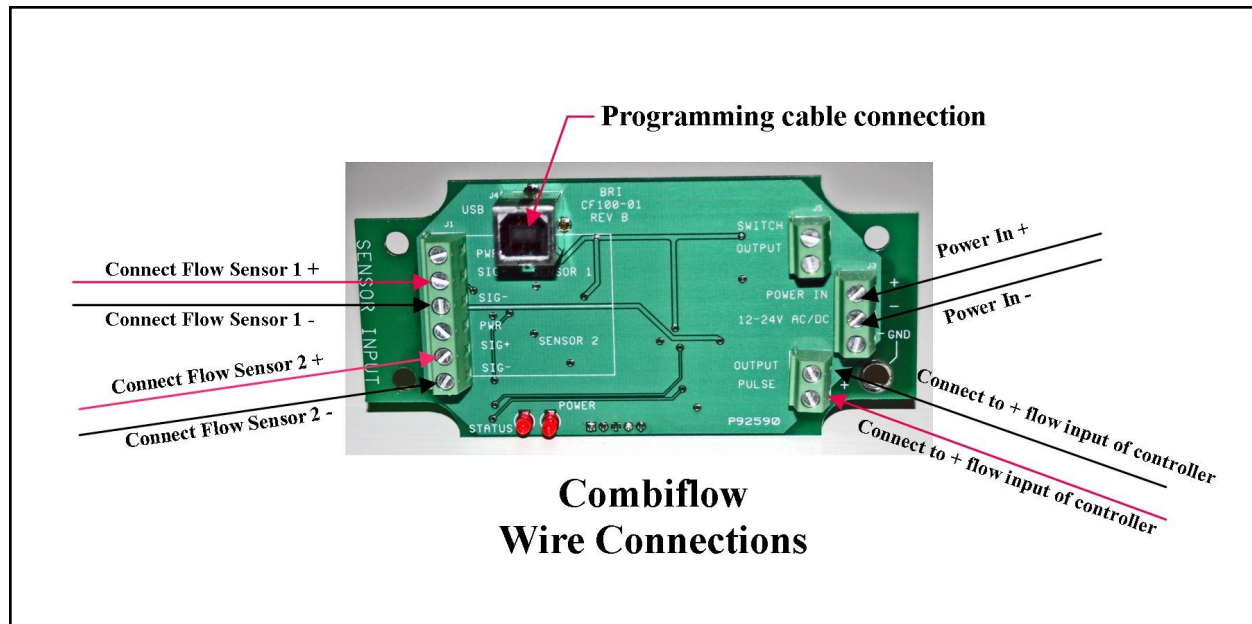
Whether you are connecting flow sensors to a Combiflow, an Isoflow or straight to a controller, you should always use a shielded twisted pair of wires rated for underground service. Two wire sensors do not require large diameter conductors because their power demand is very low. However, they can be affected by electrical interference or "noise" that disrupts the signal and creates false flow readings. Shielding the cable jacket and twisting the wire conductors helps prevent interference. Longer distances from the flow sensor increases the chance of interference as does a high concentration of underground wiring in urban settings. #16 or #18 gauge wire is often used in single pair cables for mechanical strength but #20 or #22 gauge conductors used in multi-pair cables will conduct flow sensor signals just as well. Avoid locating flow sensor wires in the same trench as buried AC power lines and provide at least 12" of vertical separation when crossing power wires.

11. Will it work with all kinds of irrigation controllers?

Combiflow will operate with any irrigation controller equipped to receive a two wire flow sensor input. In some instances, an accessory device may be required to change the signal format. Check with Creative Sensor Technology regarding the proper connection to your controller.

12. Can you provide a simple wiring diagram?

Programming cable connection

Connect Flow Sensor 1 +

Connect Flow Sensor 1 -

Connect Flow Sensor 2 +

Connect Flow Sensor 2 -

Power In +

Power In -

Connect to + flow input of controller

Connect to + flow input of controller

**Combiflow
Wire Connections**

Note:
1. All wire connections are made to the terminal strip sides facing the center of the board, wire paths are shown to the outside for ease in labeling.
2. Power can be any 12 to 24 Volt, AC or DC supply. If you use a DC supply be sure to connect the + and - terminals correctly.
3. The wire colors are shown to match the CST flow sensors. If others are used, observe the + and - polarity.
4. The programming cable is only connected during programming.
5. Terminal blocks will accommodate wire sizes from 16 to 22 AWG.